Rice Consumption among US Adults with CD: Impact on Inorganic Arsenic Intake

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Objective
To assess rice consumption patterns of adults with celiac disease.

Background

* Inorganic arsenic is a known carcinogen and ingestion may cause an increased risk of certain cancers.
* The EPA and the FDA have limits on the amount of total arsenic that may be found in drinking water and bottled water, respectively of 10 micrograms per liter (1,2).
* The FDA recently proposed an action level of 10 ppb of inorganic arsenic in apple juice (same level set for water) (3).
* Several foods may contain inorganic arsenic and contribute to an individual’s exposure, including rice and rice-based products.
* If individuals with CD have a largely rice-based diet inorganic arsenic may be an issue.
* The EPA has set a reference dose for chronic oral exposure to inorganic arsenic of 0.3 micrograms per kg per day (4).

Methods
A survey containing questions on estimated weekly intake of servings of various categories of rice and rice products was posted on Survey Monkey for 30 days.

Results

* 984 responses were received from individuals 18 years or older (13.8 % men, 86.3% women) and biopsy diagnosed with celiac disease.
* Using cumulative percentages, median servings per week were:
  - Rice: 3 servings (interquartile range: 1 to 4 servings) (fig. 1)
  - Rice-based cereal: 1 serving (IQR: 0 to 3 servings) (fig. 2)
  - Rice-based pasta: 1 serving (IQR: 1 to 2 servings) (fig. 3)
  - Rice-based bread products: 3 servings (IQR: 1 to 6 servings) (fig. 4)
  - Rice cakes, crackers, chips: 2 servings (IQR: 1 to 4 servings) (fig. 5)
  - Rice-based tortilla: 0 servings (IQR: 0 servings) (fig. 6)
  - Rice-based cookies: 0 servings (IQR: 0 to 2 servings) (fig. 7)
  - Rice-based milk substitute: 0 servings (IQR: 0 to 2 servings) (fig. 8)
  - Snack bars containing rice syrup: 0 servings (IQR: 0 to 2 servings (fig. 9)

Conclusion

* Respondents consumed the greatest median number of servings from cooked rice, bread and bread products, and rice-based snack foods.
* A hypothetical individual consuming median amounts from each category of product would consume 10 servings of rice products each week.
* For each survey questions some individuals responded that they consumed the maximum number of servings which was listed as >/= 8.
* Based on these rice consumption patterns some individuals with celiac disease may be at risk of consuming above the EPA reference dose for chronic oral exposure to inorganic arsenic.

References


www.glutenfreedietitian.com